

ABSTRACT

The present invention provides a fuel feeding apparatus and method for improving the controllability of mixing process and mixing ratio of fuel and combustion air, and a combustion system and method for effecting new combustion properties. The fuel feeding apparatus of the combustion system has fuel feeding means, combustion gas extraction means, steam supply means, mixing means and fuel gas introduction means. The combustion gas extraction means extracts combustion gas of a combustion area therefrom. The mixing means mixes the fuel of fuel feeding means with at least one of combustion gas extracted from the furnace and steam of a steam generator. The fuel gas introduction means introduces a mixed fluid of combustion gas, steam and fuel to the combustion area as a fuel gas, and allows the fuel gas to be mixed with the combustion air. A step of mixing the fuel with the combustion gas after extracted from the furnace and a step of mixing the fuel gas with the combustion air are stepwisely carried out, so that the controllability of mixing process and ratio of the air and fuel is improved. Such a control of fuel gas flow enables control of characteristics of flame and production of flame with new properties in the combustion area.